

Borehole

60-00-08

Log Event A

Borehole Information

Farm : <u>U</u>	Tank : <u>U</u>	Site Number : <u>299-W18-55</u>
N-Coord : <u>37,935</u>	W-Coord : <u>75,908</u>	TOC Elevation : <u>664.84</u>
Water Level, ft :	Date Drilled : <u>11/30/1944</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.365</u>	ID, in. : <u>10</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>150</u>	
Type : <u>Steel welded</u>	Thickness : <u>0.500</u>	ID, in. : <u>12</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>50</u>	

Cement Bottom, ft. : 151 Cement Top, ft. : 150

Borehole Notes:

This borehole was started with 12-in. casing and completed with 10-in casing. The 12-in. casing was extended to a depth of 50 ft; the 10-in. casing was run to the completion depth of 150 ft. One-half sack of cement was used to set the 10-in. casing. There is no indication that the space between the 12-in. and 10-in. casing was filled with cement.

The lower casing was perforated with a staggered pattern of six 1/2-in. by 3-in. slots placed at 12-in. intervals between depths of 48 and 148 ft.

The borehole is blocked at approximately 73 ft in depth. The blockage occurred before the earliest log on record (11/28/79).

The zero reference is the top of the casing.

Equipment Information

Logging System : <u>1</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>10/1995</u>	Calibration Reference : <u>GJPO-HAN-3</u>	Logging Procedure : <u>P-GJPO-1783</u>

Log Run Information

Log Run Number : <u>1</u>	Log Run Date : <u>12/12/1995</u>	Logging Engineer: <u>Bob Spatz</u>
Start Depth, ft.: <u>73.5</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>0.0</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

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Analysis Information

Analyst : H.D. Mac LeanData Processing Reference : P-GJPO-1787Analysis Date : 7/17/1996**Analysis Notes :**

The log of this borehole was completed in a single logging run. The borehole is blocked at its mid-depth, preventing completion of a planned second logging run. The pre- and post-field verification spectra indicate that the logging system was operating properly during data collection. The energy/channel drift observed during the logging runs remained within an acceptable range for the search parameters used by the processing software; multiple energy calibrations were not required to process the data. The monitored portions of the verification spectra indicated no deterioration in the efficiency of the detector. Because the logging was completed in a single run, no data overlaps occurred and repeatability of the calculated radionuclide concentrations was not observed in this particular borehole; however, radionuclide calculations of overlapping segments of logs acquired in other boreholes both before and after this logging run were within the statistical uncertainty of the measurements, indicating acceptable repeatability.

The casing thickness is presumed to be 0.365 inch (in.), on the basis of published thickness for schedule-40, 10-in. steel casing. Even though an additional 12-in. casing is believed to be present in the upper 50 ft of the borehole, only a single casing-correction factor (for a 0.365-in.-thick steel casing) was applied during analysis. The thickness of the suspected 12-in. casing is presumed to be 0.406 in., on the basis of the accepted thickness of schedule-40, 12-in. steel pipe. However, because the attenuation of two separate pipes is presumed to differ from that of a single tube of equivalent thickness, the data has been corrected only for a single 10-in. casing throughout the length of the borehole.

Cs-137 was the only man-made radionuclide detected. Cs-137 occurs continuously between the ground surface and the maximum depth reached by the logging tool (73.5 ft). The concentrations of Cs-137 in the continuous zone ranged from 0.2 to about 2 pCi/g. The maximum concentration of about 2 pCi/g was measured at a depth of 53 ft below the surface. In addition, elevated Cs-137 concentration (about 1 pCi/g) was observed at the top of the borehole. The presence of a double casing (both 12-in. and 10-in.) is suspected in the upper 50 ft of the borehole. Nevertheless, because the presence of the 12-in. casing could not be visually verified, and because the correction factor for the gamma-ray attenuation of a dual thickness of casing is unknown, corrections for the gamma-ray attenuation of only a single 10-in. casing have been applied in the calculation of the radionuclide concentrations in this region of the borehole. Calculated concentrations may be understated by as much as 80 to 100 percent. The calculated concentration of the natural radionuclides (K-40, U-238, and Th-232) approximately doubles at the transition between the single-cased and the suspected double-cased portion of the borehole.

Details regarding the interpretation of the data for this borehole are presented in the Tank Summary Data Report for tank U-112.

Log Plot Notes:

Separate log plots show the man-made (e.g., Cs-137) and the naturally occurring radionuclides (K-40, U-238, and Th-232). The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

A combination plot includes both the man-made and natural radionuclides, in addition to the total gamma



Spectral Gamma-Ray Borehole
Log Data Report

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derived from the spectral data and the Westinghouse Hanford Company (WHC) Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data from WHC with no attempt to adjust the depths to coincide with the SGLS data.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the minimum detection level (MDL). The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.